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Proprietà nutrizionali-salutistiche e conservazione della frutta secca in guscio

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Nutritional-health properties and storage of tree nuts

Abstract. Tree nuts are tasty dry fruits rich in lipids. They are a calorie-dense and nutritious foodstuff, which provides valuable macronutrients, micronutrients, and several health-promoting phytochemicals, among which: phytosterols, squalene, selenium, tocopherols and phenolic antioxidants. The high level of calories has traditionally conditioned and limited the consumption of tree nuts; however, it has been recently evidenced that moderate consumption of these fruits doesn't influence body weight, whilst it could be beneficial for human wellness, reducing the risks of cardiovascular diseases and several chronic alterations associated with oxidative stress, such as: various types of cancer, type-2 diabetes, resistance to insulin, gall stones and inflammations, among others. The low humidity and the low respiratory activity even at room temperature allow for preservation of the tree nuts for lengthy periods, when stored in suitable and controlled conditions. Quality maintenance is guaranteed by means of correct harvesting, handling and storage practices. The main storage problems regard: fat hydrolytic and oxidative alterations; moulds, especially when due to the aflatoxin producer *Aspergillus*; insect infestations (mites, beetles and lepidopterans). *Aspergillus* contamination may occur at various stages including crop growth, but it occurs mainly during storage under unhygienic, unventilated, hot and humid conditions; it is particularly deleterious because aflatoxins are strong toxic, cancerogenic and teratogenic agents. The high fat content gives nuts the tendency to absorb foreign smells from the surrounding environment, which can alter the aroma; the richness in unsaturated (generally polyunsaturated) fatty acids is nutritionally favourable but makes the nuts particularly prone to rancidity. Therefore, in each phase the nuts must be protected from every potential damage, must not come into contact with micro-organisms or pollutants and must be preserved in clean storerooms, with no foreign or contaminating volatiles nor other types of fruits or vegetables. Storage at room temperature means short times of preservation and involves treatments with fumigants in order to prevent some of the problems above mentioned, causing a negative impact on the natural healthfulness of the product. Water content of the nuts, temperature, relative humidity, as well as exposure to light and oxygen are the most important preservation parameters to be kept under control; the best storage conditions are subject to variation according to the nut. In this manuscript the authors reported the chemical composition, as well as the nutritional and health-promoting properties of the most common tree nuts (almonds, hazelnuts, walnuts, pine nuts and pistachios) and peanuts. They indicated macronutrients (lipids, proteins and carbohydrates) and micronutrients (minerals and vitamins) contents; moreover, they examined content and properties of the health-promoting phytochemical fraction. Depending on the nut, the best storing conditions and methods for extending the preservation without the aid of chemical treatments were individually described, with the aim of providing useful information for maintaining the quality of the product in the best possible way, for a long time.

Key words: relative humidity, controlled atmosphere, nutraceuticals, phytochemicals, storage.

Composizione chimica e proprietà nutrizionali-salutistiche della frutta secca in guscio

La frutta secca in guscio appartiene ad una categoria di alimenti ricchi in grassi e poveri in zuccheri, comprendente frutti veri e propri, semi e legumi. Largamente diffusa a livello mondiale, viene in parte consumata direttamente come prodotto fresco, essiccato o tostato, in parte destinata alla trasformazione industriale per la produzione di snack, preparazioni dolciarie, burro, olio e margarina. La frutta secca commer-

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